QLogic QLE7340 Single-Port 40 Gbps QDR InfiniBand Host Channel Adapter

IBM System x at-a-glance guide

High-performance computing (HPC) solutions have used InfiniBand networks to meet the needs of the most demanding sets of applications and grand challenges. The QLE7340 is a single-port 40 Gbps InfiniBand PCI Express Gen2 x8 host channel adapter (HCA). It is a highly integrated design that delivers a high message rate and low latency, making it the ideal solution for HPC applications.

Figure 1 shows the QLogic QLE7340 single-port 4X QDR IB PCIe 2.0 X8 host channel adapter.

Figure 1. QLogic QLE7340 Single-Port 40 Gbps QDR InfiniBand HCA

Did you know

The QLogic QLE7340 HCA is part of IBM Intelligent Cluster solution (formerly IBM Systems Cluster 1350). IBM Intelligent Cluster is your key to a fully integrated HPC solution. IBM clustering solutions include servers, storage, and industry-leading OEM interconnects that are factory-integrated, fully tested, and delivered to your door, ready to plug into your data center, all with a single point of contact for support.

Part number information

Table 1. Ordering part numbers and feature codes

Description	Part number	Feature code
QLogic QLE7340 Single-Port 40 Gbps QDR InfiniBand HCA	59Y1888	5763
0.5 m QLogic Copper QDR InfiniBand QSFP 30AWG Cable	59Y1892	3725
1 m QLogic Copper QDR InfiniBand QSFP 30AWG Cable	59Y1896	3726
3 m QLogic Copper QDR InfiniBand QSFP 28AWG Cable	59Y1900	3727
3 m QLogic Optical QDR InfiniBand QSFP Cable	59Y1920	3731
10 m QLogic Optical QDR InfiniBand QSFP Cable	59Y1924	3732
30 m QLogic Optical QDR InfiniBand QSFP Cable	59Y1928	3733
3m IBM Optical QDR InfiniBand QSFP Cable	49Y0488	5989
10m IBM Optical QDR InfiniBand QSFP Cable	49Y0491	5990
30m IBM Optical QDR InfiniBand QSFP Cable	49Y0494	5991

Features and benefits

The QLogic QLE7340 HCA has the following summary of features and specifications:

- 40 Gbps InfiniBand interface (40/20/10 Gbps auto-negotiation)
- 3400 MBps unidirectional throughput
- Approximately 30 million messages processed per second (non-coalesced)
- Approximately 1.0 microsecond latency that remains low as the fabric is scaled
- Multiple virtual lanes (VLs) for unique quality of service (QoS) levels per lane over the same physical port
- TrueScale architecture, with MSI-X interrupt handling, optimized for multi-core compute nodes
- Operates without external memory
- Optional data scrambling in InfiniBand link
- Complies with InfiniBand Trade Association 1.2 standard
- Supports OpenFabrics Alliance (OFED) software distributions, WinOF support planned for 1Q/2010

Key benefits of the QLogic QLE7340 HCA are:

- **High performance**: Quad Data Rate (QDR) InfiniBand (IB) delivers 40 Gbps per port (4x10 Gbps), providing the necessary bandwidth for high-throughput applications. With one of the highest message rates and lowest latencies of any IB adapter, the QLE7340 provides superior HPC application performance.
- **Superior scalability**: QLogic's TrueScale architecture is designed to deliver near linear scalability. As additional compute resources are added to a cluster, latency remains low and the message rate scales with the size of the fabric, resulting in maximum utilization of compute resources.

- **Enhanced reliability**: The QLE7340's advanced design does not need onboard firmware or external memory, which enhances not only its performance, but also reliability. The application-specific integrated circuit (ASIC) has ECC protection on all internal static random access memories (SRAMs) and parity checking on all internal buses. Equally important, the stateless design is inherently more resilient to adapter and fabric failures, as it minimizes its reliance on the connection state. Optional data scrambling provides a mechanism to optimize data patterns, which in turn minimizes the bit-error rate.
- **Investment protection**: This fourth-generation product is compliant with the InfiniBand Trade Association (IBTA) Version 1.2 specification, ensuring interoperability with all other IBTA-compliant devices. In addition, support for the OpenFabrics community OFED and WinOF distributions ensures rapid adoption by major operating system vendors, system integrators, and independent hardware vendors (IHVs) and independent software vendors (ISVs).
- **Power optimized**: Maximum performance is delivered at the lowest power (3.8 W typically and 6.7 W maximum) of any QDR-capable adapter.
- **Environmentally friendly**: The QLE7340 is RoHS 6 compliant as well as antimony free and halogen free.

Specifications

QLogic QLE7340 HCA has the following specifications:

- One QDR 4X InfiniBand external port
- PCI Express Gen 2 x8 host bus interface
- Low-profile form-factor PCI Express adapter (2U and 3U brackets supplied)
- Data rates of 40, 20, or 10 Gbps (auto-negotiated)
- Compliant with PCI Hot Plug Specification 1.0, PCI Bus Power Management Interface Specification 1.2
- Virtual lanes: configurable for one, two, four, or eight virtual lanes: 2 KB MTU or 4 KB MTU (single IB port)
- MTU: All standard IB MTUs including 4 KB
- External port supports Quad Small Form Factor Pluggable (QSFP) optical and copper cable specifications, and CX4/microGigaCN specifications (See Table 1 for supported cables.)

Operating environment

The adapter is supported in this environment:

- Temperature:
  - Operating: 0° to 55°C (estimated)
  - Storage: -40° to 70°C (estimated)
- Relative humidity: 10% to 95% (non-condensing)
- Power consumption: typical 3.8 W, maximum 6.7 W (estimated)

Supported servers

The QLogic QLE7340 HCA is supported in the IBM System x servers listed in Table 2 as part of the IBM Intelligent Cluster portfolio.

Table 2. Supported servers in the IBM Intelligent Cluster portfolio

	Feature code	x3550 M2	x3550 M3	x3650 M2	x3650 M3	x3755	x3690 X5	iDataPlex dx360 M2	iDataPlex dx360 M3	HS22	HS22V	LS22	LS42	JS23/JS43
QLogic QLE7340 HCA	5763	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N

Popular configurations

Figure 2 illustrates how the QLogic QLE7340 HCA can be used in configurations. In this example, we connect all InfiniBand HCAs to a QLogic 12200 QDR InfiniBand switch.

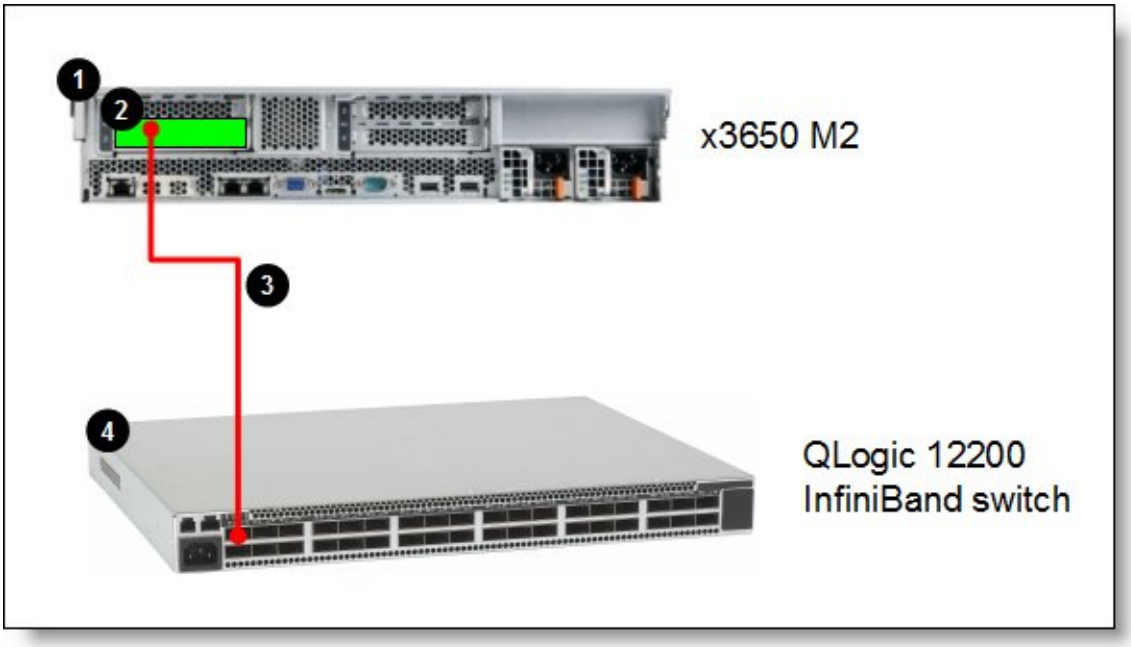

Figure 2. x3650 M2 server with the QLogic QLE7340 HCA connected to an InfiniBand network

The parts used are listed in Table 3.

Table 3. Components used when connecting QLogic QLE7340 HCA to an InfiniBand network (Figure 2)

Diagram reference	Part number/machine type	Description	Quantity
1	Varies	x3650 M2 or other supported server (See Table 2.)	1
2	59Y1888	QLogic QLE7340 HCA	1
3	Varies	QLogic QDR InfiniBand QSFP Cable, copper or optical (See Table 1.)	1
4	0449-020	QLogic 12200 (iDPx) 36-port QDR InfiniBand Switch Bundle	1

Supported operating systems

The QLogic QLE7340 HCA as part of an IBM Intelligent Cluster solution supports the following operating systems:

- SUSE Linux Enterprise Server (SLES) 10 and 11 (64-bit)
- Red Hat Enterprise Linux 5 (64 bit)

Related publications

For more information refer to these documents:

- Publications for the Cluster 1350:
  http://www.ibm.com/support/docview.wss?uid=psg1MIGR-5080504
- QLogic QLE7340 HCA product page:
  http://www.qlogic.com/Products/HPCNetworking/InfiniBandAdapters/Pages/QLE7340.aspx

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